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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/533,605	04/29/2005	Yukihiro Morita	92478-2600	4549

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SNELL & WILMER LLP (OC)
600 ANTON BOULEVARD
SUITE 1400
COSTA MESA, CA 92626

EXAMINER	
RAABE, CHRISTOPHER M	
ART UNIT	PAPER NUMBER
2879	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/22/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/533,605	MORITA ET AL.	
	Examiner	Art Unit	
	Christopher M. Raabe	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25 and 28-38* is/are rejected.

7)☐ Claim(s) *26 and 27* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 April 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/29/05,10/24/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1,3-6,19,21,23,24,29-38 are rejected under 35 U.S.C. 102(b) as being anticipated by Takatani et al. (JP 9-208851).

With regard to claim 1,

Takatani et al. disclose a plasma display panel in which a first substrate having a protective layer formed thereon opposes a second substrate across a discharge space, with the substrates being sealed around a perimeter-thereof (paragraphs 1,2), comprising: at a surface of the protective layer, a first material and a second material of different electron emission properties are exposed to the discharge space, with at least one of the first material and the second material being in a dispersed state, wherein the first and second materials are respectively first and second crystals, and the second crystal is dispersed throughout the first crystal at the surface of the protective layer (paragraph 12).

With regard to claim 3,

Takatani et al. disclose the plasma display panel, wherein the second crystal is of higher purity than the first crystal (paragraphs 20,22).

With regard to claim 4,

Takatani et al. disclose the plasma display panel, wherein the protective layer is formed mainly from MgO, and the second crystal is formed from fine MgO crystalline particles (paragraph 12).

With regard to claim 5,

Takatani et al. disclose the plasma display panel, wherein the first crystal is obtained by baking an MgO precursor (paragraph 12).

With regard to claim 6,

Takatani et al. disclose the plasma display panel, wherein the second crystal is oxygen rich MgO (paragraph 12).

With regard to claim 19,

Takatani et al. disclose a protective film for a plasma display panel formed in relation to a substrate surface that opposes a discharge space, wherein at least a surface portion of the protective layer facing into the discharge space includes a first crystal and a second crystal of different electron emission properties, the second crystal being dispersed throughout the first crystal (paragraphs 1,2, and 12).

With regard to claim 21,

Takatani et al. disclose a discharge light-emitting diode comprising a discharge space having a discharge gas enclosed therein and a protective layer facing into the discharge space, and for emitting light by generating a plasma in the discharge space, wherein at least a surface

portion of the protective layer facing into the discharge space includes a first crystal and a second crystal of different electron emission properties, the second crystal being dispersed throughout the first crystal (paragraphs 1,2, and 12).

With regard to claim 23,

Takatani et al. disclose a PDP manufacturing method comprising the steps of forming a protective layer on a first substrate and sealing the first substrate and a second substrate together via a discharge space with the protective layer facing into the discharge space, wherein the layer-forming step includes the substeps of mixing a second crystalline material in a first crystalline material, applying the mixture to a surface of the first substrate, and baking the applied mixture (paragraphs 1,2,11,12).

With regard to claim 24,

Takatani et al. disclose the manufacturing method, wherein an MgO precursor is used as the first crystalline material, and fine MgO crystalline particles are used as the second crystalline material (paragraphs 11, 12).

With regard to claim 29,

Takatani et al. disclose the plasma display panel. The phrase "wherein the first crystal is obtained at least by vacuum deposition, electron beam deposition or sputtering" does not structurally distinguish the claimed invention from the prior art, as is required of apparatus claims (MPEP 2114).

With regard to claims 30-32,

Takatani et al. disclose the plasma display panel. The phrase "wherein the first crystal is obtained using a thin film technique" does not structurally distinguish the claimed invention from the prior art, as is required of apparatus claims (MPEP 2114).

With regard to claims 33-35,

Takatani et al. disclose the plasma display panel wherein the second crystal is formed from particles of several dozen to several hundred nanometers in size (paragraph 24).

With regard to claims 36-37,

Takatani et al. disclose the plasma display panel, wherein the second crystal is formed from a combination of materials (paragraph 12).

With regard to claim 38,

Takatani et al. disclose the plasma display panel, wherein the fine MgO crystalline particles are formed from a suitable combination of materials (paragraph 12).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 7,25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takatani et al., as applied to claims 1,24 above, and further in view of Nakahara et al. (EP 0881657).

With regard to claim 7,

Takatani et al. disclose the plasma display panel.

Takatani et al. do not disclose a crystal of the protective layer to be doped with one or more members selected from the group consisting of Si, H, and Cr.

Nakahara et al. do disclose a protective layer to be doped with one or more members selected from the group consisting of Si, H, and Cr (page 4 lines 25-30), reducing black noise.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the dopant disclosed by Nakahara et al. into the plasma display panel of Takatani et al., in order to reduce black noise.

With regard to claim 25,

Takatani et al. disclose the manufacturing method.

Takatani et al. do not disclose a crystal of the protective layer to be doped with one or more members selected from the group consisting of Si, H, and Cr.

Nakahara et al. do disclose a protective layer to be doped with one or more members selected from the group consisting of Si, H, and Cr (page 4 lines 25-30), reducing black noise.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the dopant disclosed by Nakahara et al. into the plasma display panel of Takatani et al., in order to reduce black noise.

5. Claims 8,20,22,28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takatani et al., as applied to claim 1 above, and further in view of Okuyama et al. (JP 2003-272530).

With regard to claim 8,

Takatani et al. disclose the plasma display panel, wherein at least a surface portion of the protective layer facing into the discharge space includes MgO as the first material (paragraph 12).

Takatani et al. do not disclose at least one of fullerene and carbon nanotube as the second material.

Okuyama et al. do disclose one of fullerene and carbon nanotube as a second material in an MgO protective layer (paragraph 21), reducing driving voltage.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the materials of Okuyama et al. into the panel of Takatani et al. in order to reduce driving voltage.

With regard to claim 20,

Takatani et al. disclose a protective film for a plasma display panel formed in relation to a substrate surface that opposes a discharge space, wherein at least a surface portion of the protective layer facing into the discharge space includes MgO (paragraph 12).

Takatani et al do not disclose at least one of fullerene and carbon nanotube dispersed throughout the MgO.

Okuyama et al. do disclose one of fullerene and carbon nanotube dispersed throughout MgO (paragraph 21), reducing driving voltage.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the materials of Okuyama et al. into the panel of Takatani et al. in order to reduce driving voltage.

With regard to claim 22,

Okuyama et al. disclose a discharge light-emitting diode comprising a discharge space having a discharge gas enclosed therein and a protective layer facing into the discharge space, and for emitting light by generating a plasma in the discharge space, wherein at least a surface portion of the protective layer facing into the discharge space includes MgO (paragraph 12).

Takatani et al do not disclose at least one of fullerene and carbon nanotube dispersed throughout the MgO.

Okuyama et al. do disclose one of fullerene and carbon nanotube dispersed throughout MgO (paragraph 21), reducing driving voltage.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the materials of Okuyama et al. into the panel of Takatani et al. in order to reduce driving voltage.

With regard to claim 28,

Takatani et al. disclose a PDP manufacturing method comprising the steps of forming a protective layer on a first substrate and sealing the first substrate and a second substrate

together via a discharge space with the protective layer facing into the discharge space, wherein the layer-forming step includes the substeps of mixing a substance in an MgO precursor, applying the mixture to a surface of the first substrate, and baking the applied mixture (paragraph 12).

Takatani et al. do no disclose at least one of fullerene and carbon nanotube to be mixed with the MgO.

Okuyama et al. do disclose at least one of fullerene and carbon nanotube to be mixed with MgO (paragraph 21), reducing driving voltage.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the materials of Okuyama et al. into the panel of Takatani et al. in order to reduce driving voltage.

6. Claims 9-16,18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takatani et al., as applied to claim 1 above, and further in view of Aboelfotoh et al. (USPN 4340840).

With regard to claim 9,

Takatani et al. disclose the plasma display panel.

Takatani et al. do not disclose at least a surface portion of the protective layer facing into the discharge space including at least one of an isolated metal material, an insulating material having a higher Fermi energy than MgO, and a semiconductor material having a higher Fermi energy than MgO as the second material.

Aboelfotoh et al. do disclose at least a surface portion of the protective layer facing into the discharge space including at least one of an isolated metal material, an insulating material

having a higher Fermi energy than MgO, and a semiconductor material having a higher Fermi energy than MgO as the second material (column 3, lines 35-45), reducing driving voltage.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the material of Aboelfotoh et al. into the panel of Takatani et al. in order to reduce driving voltage.

With regard to claim 10,

Takatani et al. disclose the plasma display panel.

Takatani do not disclose the isolated metal material.

Aboelfotoh et al. do disclose the isolated metal material having a work function less than or equal to 5 eV (column 3, lines 35-45), reducing driving voltage.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the material of Aboelfotoh et al. into the panel of Takatani et al. in order to reduce driving voltage.

With regard to claim 11,

Takatani et al. disclose the plasma display panel.

Takatani do not disclose the isolated metal material.

Aboelfotoh et al. do disclose the isolated metal material to be a member selected from the group consisting of Fe, Al, Mg, Ta, Mo, W, and Ni (column 3, lines 35-45), reducing driving voltage.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the material of Aboelfotoh et al. into the panel of Takatani et al. in order to reduce driving voltage.

With regard to claim 12,

Takatani et al. disclose the plasma display panel.

Takatani do not disclose the isolated metal material.

Aboelfotoh et al. do disclose plural pairs of display electrodes being disposed between the protective layer and the first substrate, and the isolated metal material is positioned so as to overlap the pairs of electrodes in a thickness direction of the protective layer (column 3, lines 35-45 and 12,4,2 of fig 1).

With regard to claim 13,

Takatani et al. disclose the plasma display panel, wherein at least a surface portion of the protective layer facing into the discharge space includes MgO as the first material (paragraph 12).

Takatani et al. do not disclose at least a surface portion of the protective layer facing into the discharge space including at least one of an isolated metal material, an insulating material having a higher Fermi energy than MgO, and a semiconductor material having a higher Fermi energy than MgO as the second material.

Aboelfotoh et al. do disclose at least a surface portion of the protective layer facing into the discharge space including at least one of an isolated metal material, an insulating material having a higher Fermi energy than MgO, and a semiconductor material having a higher Fermi energy than MgO as the second material (column 3, lines 35-45), reducing driving voltage.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the material of Aboelfotoh et al. into the panel of Takatani et al. in order to reduce driving voltage.

With regard to claim 14,

Takatani et al. disclose the plasma display panel, wherein the second material is present at a grain boundary of the MgO included as the first material (paragraph 12).

With regard to claim 15,

Takatani et al. disclose the plasma display panel.

Takatani do not disclose the isolated metal material.

Aboelfotoh et al. do disclose the isolated metal material having a work function less than or equal to 5 eV (column 3, lines 35-45), reducing driving voltage.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the material of Aboelfotoh et al. into the panel of Takatani et al. in order to reduce driving voltage.

With regard to claim 16,

Takatani et al. disclose the plasma display panel.

Takatani do not disclose the isolated metal material.

Aboelfotoh et al. do disclose the isolated metal material to be a member selected from the group consisting of Fe, Al, Mg, Ta, Mo, W, and Ni (column 3, lines 35-45), reducing driving voltage.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the material of Aboelfotoh et al. into the panel of Takatani et al. in order to reduce driving voltage.

With regard to claim 18,

Takatani et al. disclose the plasma display panel, wherein the plasma display device has a plurality of discharge cells that divide the discharge space, and the second material is locally present in each discharge cell (paragraph 39 and table 2).

7. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takatani et al. and Aboelfotoh et al., as applied to claim 13 above, and further in view of Okuyama et al. (as above).

With regard to claim 17,

Takatani et al. and Aboelfotoh et al. disclose, as stated in the rejection of claim 13, the plasma display panel, wherein the protective layer is formed from the first material that includes MgO, and the second material that includes at least one of the metal material, the insulating material having a higher Fermi energy than MgO and the semiconductor material having a higher Fermi energy than MgO.

Takatani et al. do not disclose the layer to be a nanocomposite material.

Okuyama et al. do disclose the protective layer to be a nanocomposite layer (paragraph 21), reducing driving voltage.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the materials of Okuyama et al. into the panel of Takatani et al. and Aboelfotoh et al. in order to reduce driving voltage.

Allowable Subject Matter

8. Claims 26,27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art does not disclose nor make obvious a PDP manufacturing method wherein, in addition to the other limitations of the claim, the second crystalline material is doped with H be either annealing or plasma doping. Therefore claim 26 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Additionally, the prior art does not disclose nor make obvious a PDP manufacturing method wherein, in addition to the other limitations of the claim, the second crystalline material is doped with Si by plasma doping using SiH_4 or Si_2H_6. Therefore claim 27 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. USPN 6335393, 2004/0145316, 6242864, 2006/0038495, 2005/0264211, 4297613.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Raabe whose telephone number is 571-272-8434. The examiner can normally be reached on m-f 7am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CR

ASHOK PATEL
PRIMARY EXAMINER